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A review of the genus *Paraleptomenes* Giordani Soika, 1970 (Hymenoptera, Vespidae, Eumeninae) from China, with descriptions of two new species

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Abstract

In this paper, a total of five species of the genus *Paraleptomenes* Giordani Soika, 1970 is reported from China, including two new species and two newly recorded species. The two new species *P. setaceus* **sp. nov.** and *P. transfoveolus* **sp. nov.** are described and illustrated in detail. *P. darugiriensis* Kumar, Carpenter & Sharma, 2014 and *P. nurseanus montanus* Giordani Soika, 1994 are first recorded from China. Photos of the type specimen of *P. kosempoensis* (Schulthess, 1934) deposited in the American Museum of Natural History are provided. Furthermore, a key to the world species of *Paraleptomenes* is updated.

Keywords

Hymenoptera, Eumeninae, *Paraleptomenes*, new species, new record, China

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Introduction

The genus *Paraleptomenes* Giordani Soika, 1970 of the subfamily Eumeninae, containing 9 valid species and 3 additional subspecies, is distributed mainly in the Oriental region, especially in India (Kumar et al. 2014). These known species and subspecies were described by de Saussure (1855, 1867), Cameron (1901), Schulthess (1934), Giordani Soika (1970, 1994), Kumar et al. (2014) and Nguyen and Nguyen (2020), respectively. So far, only one species, namely, *P. kosempoensis*, was reported from Taiwan, China by Schulthess (1934). In our collections of Chinese eumenids over the past years, specimens of four species were collected from the areas belonging to the Oriental Region, of which two species are new to science and two are new records for China. In present paper, the two new species are described in detail and illustrated, and the new records are provided with diagnosis and figures. Based on a type specimen of *P. kosempoensis* deposited in the American Museum of Natural History, New York, its diagnosis and related photos are also given. By referring to the keys of both Giordani Soika (1994) and Kumar et al. (2014), an updated key to all known species of *Paraleptomenes* is provided.

Materials and methods

The specimens examined in our study are deposited in the Institute of Entomology and Molecular Biology, Chongqing Normal University, Chongqing, China (**CNU**) and the American Museum of Natural History, New York (**AMNH**). Descriptions and measurements were made under a stereomicroscope (Olympus SZ61). All figures were taken with Keyence VHX-5000 digital microscope and Photoshop CS 6 was used to make the plates. Body length was measured from the anterior margin of the head to the posterior margin of metasomal tergum 2. For the density description of punctures, "sparsely" means that interspaces are larger than one puncture diameter, "moderately" means equal to the diameter, and "densely" means less than one diameter. The abbreviations used in the text are shown as follows: A (1, 2, …) for antennal joints, T (1, 2, …) for metasomal terga, S (1, 2, …) for metasomal sterna. Terminology principally follows Kumar et al. (2014).

Taxonomy

Genus *Paraleptomenes* Giordani Soika, 1970

Paraleptomenes Giordani Soika 1970: 79. Type species: *Paraleptomenes nurseanus* Giordani Soika, 1970, by original designation and monotypy; Giordani Soika, 1994: 122–132 (revision).

Diagnosis. Posterior area of hind ocelli depressed inward flatly, forming an acute angle with frons; anterior face of pronotum with one or two foveae in the middle or

not obvious, laterally with dense punctures (Figs 5, 16, 24, 31); tegula not reaching posteriorly to the apex of parategula (Figs 7, 15, 26, 33, 39); posterior surface with submarginal carina produced into pointed lamella apically, valvula enlarged and free posteriorly from submarginal carina (Figs 19, 28, 32); the second submarginal cell of fore wing not petiolate; first metasomal segment subsessile, in dorsal view narrower than second; T1 basally without transverse carina; T2 apically not reflexed (Figs 1, 2, 11, 12, 20, 21, 29, 34, 35).

Distribution. Oriental Region.

***Paraleptomenes setaceus* Bai, Chen & Li, sp. nov.**

http://zoobank.org/5BA279B9-A64C-47C0-9B21-CCD1EE46A61D

Figs 1–10

Material examined. ***Holotype***, 1♀, China, Yunnan Province, Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, 21°55'2"N, 101°16'25.99"E, 584 m, 2015.iv.11, Chunhong Wang (CNU); ***Paratype***, 1♂, China, Yunnan Province, Dai Autonomous Prefecture of Xishuangbanna, Mengla County, Shangyong Town, Moxie Village, 21°20'16.8"N, 101°41'16.8"E, 679 m, 2017.viii.6, Tingjing Li (CNU).

Description. Female (Fig. 1). Body length 6.3 mm, forewing length 5.7 mm; black, with the following parts orange-yellow: base of mandible, two lateral complete bands along margins of clypeus, longitudinal interantennal spot, scape ventrally, a small spot of ocular sinus, a line behind eye at gena, an anterior interrupted band of pronotum, tegula (except brownish red at middle), parategula, metanotum, apices of fore and mid femora, fore and mid tibiae (slightly dark ventrally) and tarsi (slightly dark apically), apex of hind tibia, hind tarsus, apical bands of T1–T2, and S2 (broader on T2); wings transparent brown, fore wing with an apical dark spot.

Head. Clypeus (Fig. 3) about 1.0 times as wide as long, flat in the middle part, indistinctly with lateral longitudinal raised carina from middle to apex, with extremely fine sparse punctures, and punctures at apex larger and deeper, or even longitudinally striate, apical margin somewhat emarginated, clypeal width about 3.1 times its apical width; distance between inner eye margins at vertex about 1.2 times of the distance between inner eye margins at clypeus; interantennal space slightly raised; frons and vertex with dense punctures, punctures sparser than *P. darugiriensis* (Fig. 3); posterior area of hind ocelli with a row of short longitudinal carina along occipital carina in the middle area, occipital carina dorsally not sinuate as *P. darugiriensis* (Fig. 5); distance between posterior ocellus about equal to the distance from posterior ocellus to inner eye margin; punctures of gena sparser than vertex.

Mesosoma. Pronotum coarsely, densely punctate and reticulate, except the middle area, anterior face without obviously depressed fovea in the middle, with dense punctures and somewhat reticulate on both sides, pronotal transverse carina weak, especially absent in the middle (Fig. 5); mesoscutum with dense punctures, interspaces reticulate, with two longitudinal furrows of punctures on apical margin (Fig. 7);

Figures 1–10. *Paraleptomenes setaceus* sp. nov. Holotype (♀): **1, 3, 5, 7, 9, 10** paratype (♂): **2, 4, 6, 8**. **1, 2** habitus (dorsal view) **3, 4** head (frontal view) **5** vertex and part of pronotum (dorsal view) **6** A6–A13 **7** mesosoma (dorsal view) **8** metasoma (ventral view) **9** tegula (dorsal view) **10** mesosoma (lateral view).

scutellum convex in lateral view (Fig. 10), with dense punctures, interspaces reticulate; metanotum weakly convex, sloping down to apical margin, with dense punctures, and apical margin leathery; mesopleuron posterodorsally with obviously raised blunt teeth (Figs 9, 10), punctures mostly similar to pronotum, posteroventrally with fine sparser punctures; metapleuron smooth, sparsely punctate, punctures smaller than other parts of mesosoma; propodeum dorsally with large and deep flat-bottomed punctures, interspaces carinate and reticulate, the boundary between dorsal and posterior surfaces not obvious, punctures on lateral surface dense, interspaces carinate and reticulate, shallower than other parts of mesosoma except metapleuron; posterior surface obviously

depressed, margin with dense and shallow punctures, and medially smooth and without punctures, with short oblique striae along median carina on both sides, median carina about 0.8 times of the length of whole propodeum.

Metasoma. Leathery, punctures smaller than head and mesosoma; T1 about 1.9 times as wide as long, narrower than T2, punctures on anterior inclined surface sparse, punctures on dorsal surface dense, without punctures at the end, slightly concave near the end (Figs 1–2); T2 about 1.2 times as wide as long, with sparse punctures at base and then punctures gradually denser and larger near the apical margin, and with thin apical lamella; S2 with sparse punctures in the middle, those laterally and apically denser, larger than the base of T2, and with thin apical lamella; T3–T5 with dense punctures; metasomal segment 6 almost without punctures.

Male (Fig. 2). Body length 5.8 mm, forewing length 5.5 mm. Sculpture, punctuation, setae, and coloration as in female except as follows: clypeus (Fig. 4) yellow except outer margin, with thick white setae, clypeus about 1.2 times as wide as long, apical margin medially deeply emarginate, transparent, laterally forming a sharp tooth, clypeal width about 3.4 times as wide as that of emargination, emargination about 2.7 times as wide as long; distance between inner eye margins at vertex about 1.6 times of the distance between inner eye margins at clypeus; A13 about 1.6 times as long as basal width, small, slender, finger-like and edge almost straight, backward not reaching the base of A11 (Fig. 6); punctures of frons sparser (Fig. 4); front of mid and hind coxae yellow; metasomal segment 6 with fine sparse punctures; S7 with fine punctures and basally with a row of thick brown setae (Fig. 8).

Distribution. China (Yunnan).

Remarks. This species resembles *P. transfoveolus* sp. nov. with the character of mesopleuron posterodorsally with obviously raised blunt teeth (Figs 9, 18), and resembles *P. communis* with the character of male A13 small, slender, finger-like and almost straight, narrowed at the apex (Fig. 6). It differs from the related species and all other members of the genus by the following character combination: female clypeus with indistinct lateral longitudinal raised carina from middle to apex (Fig. 3), anterior face of pronotum in female without obviously depressed foveae in the middle (Fig. 5); A13 of the male small, slender, finger-like and lateral edge almost straight, backward reaching near the base of A11 (Fig. 6), punctures of frons sparser (Figs 3–4), mesopleuron posterodorsally with obviously raised blunt teeth (Fig. 9) and S7 basally with a row of thick brown setae (Fig. 8).

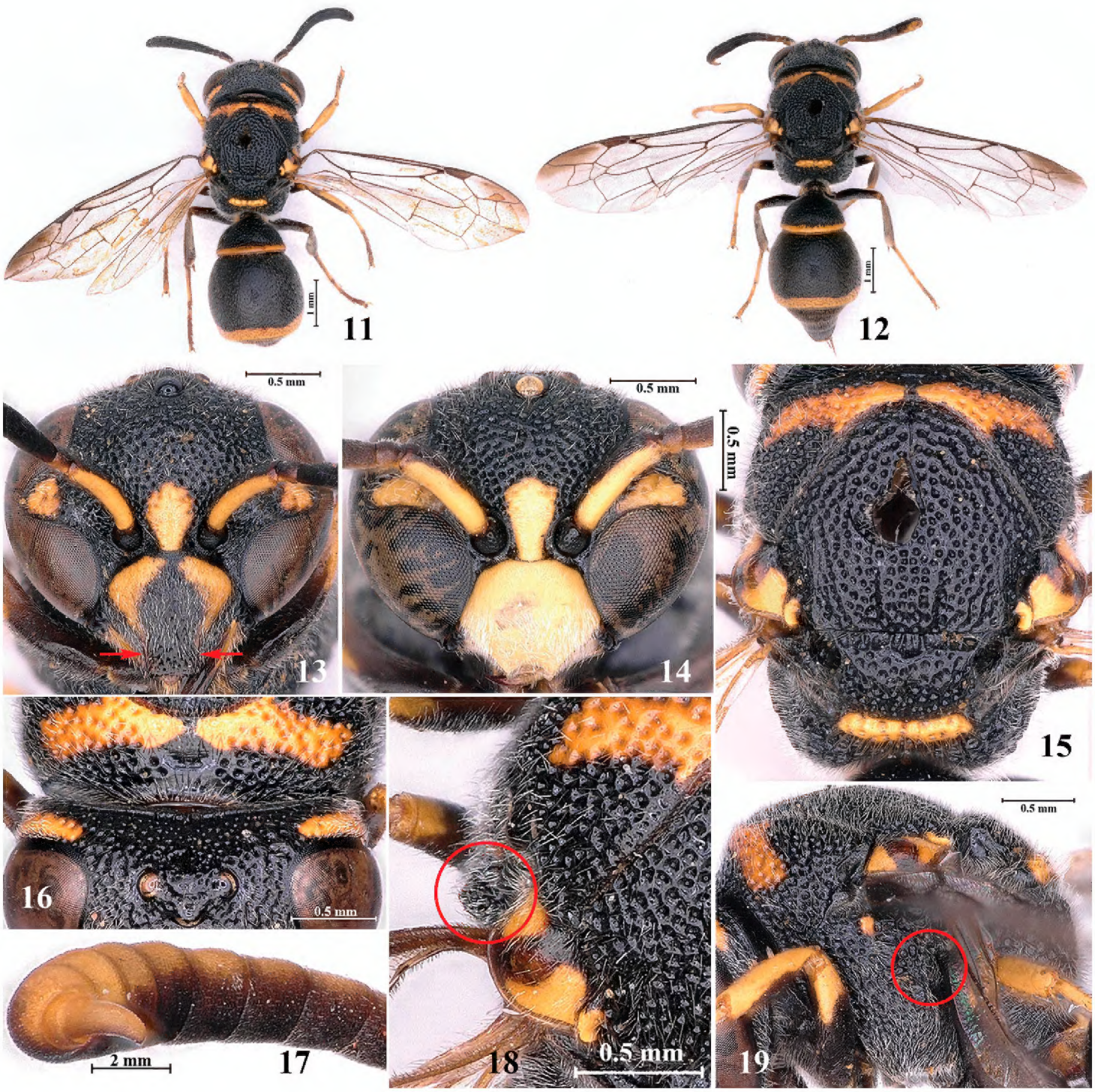
Etymology. The specific name *setaceus* is derived from Latin word: *setace* (= with hair), referring to the base of S7 with a row of thick brown setae.

***Paraleptomenes transfoveolus* Bai, Chen & Li, sp. nov.**

http://zoobank.org/FD7A75B6-8916-46CF-8E1D-CC8A121D61E8

Figs 11–19

Material examined. ***Holotype***, 1♀, China, Yunnan Province, Dai Autonomous Prefecture of Xishuangbanna, Jinghong City, near Tropical Flower Garden, 22°0'39.06"N,



Figures 11–19. *Paraleptomenes transfoveolus* sp. nov. Holotype (♀) **11, 13, 15, 16, 18, 19** paratype (♂) **12, 14, 17**. **11, 12** habitus (dorsal view) **13, 14** head (frontal view) **15** mesosoma (dorsal view) **16** vertex and part of pronotum (dorsal view) **17** A5–A13 **18** tegula (dorsal view) **19** mesosoma (lateral view).

100°47'12.01"E, 544 m, 2016.x.1, Baoxin Dong (CNU); ***Paratype***, 1♂, China, Yunnan Province, Puer City, Mojiang County, Mengnong Township, Xiaogandong Village, 23°39'55.44"N, 101°31'30.12"E, 1026 m, 2015.vii.23, Pan Huang (CNU).

Description. Female (Fig. 11). Body length 6.2 mm, forewing length 5.5 mm; black, with the following parts orange-yellow: mandible (except black at middle), two lateral large spots at the base of clypeus, longitudinal interantennal spot, scape and pedicel ventrally, A9–A12 ventrally, ocular sinus, a line behind eyes at gena, an anterior interrupted band of pronotum, tegula (except brownish red middle), parategula, a small spot on mesopleuron, metanotum, mid coxa ventrally, apices of fore and mid femora, fore and mid tibiae (slightly dark ventral), tarsi, apical bands of T1–T2 and S2 (broader on T2); wings transparent brown, fore wing with an apical dark spot.

Head. Clypeus (Fig. 13) about 1.1 times as wide as long, flat in the middle part, with lateral longitudinal raised carina from near middle to apex, and with fine sparse punctures, punctures at apex larger and deeper, or even longitudinally striate, apical margin a bit emarginated and almost truncated, clypeal width about 3.2 times its apical width; distance between inner eye margins at vertex about 1.3 times of the distance between inner eye margins at clypeus; interantennal space slightly raised; frons and vertex with dense punctures, interspaces reticulate, posterior area of hind ocelli with a row of short longitudinal carina along the occipital carina in the middle area, occipital carina dorsally not sinuate as *P. darugiriensis* (Fig. 16); distance between posterior ocellus about 1.3 times of the distance from posterior ocellus to inner eye margin; punctures of gena sparser and smaller than that on vertex.

Mesosoma. Pronotum coarsely, densely punctate and reticulate, except the middle area, anterior face with a transverse fovea in the middle, with dense punctures and somewhat reticulate on both sides, pronotal transverse carina weak, especially absent in the middle (Fig. 16); mesoscutum (Fig. 15) with dense punctures, interspaces reticulate, with two longitudinal furrows of punctures on apical margins; scutellum convex in lateral view (Fig. 19), with dense punctures, interspaces reticulate; metanotum weakly convex, sloping down to apical margin, with dense punctures; mesopleuron posterodorsally with obviously raised blunt teeth (Figs 18–19); punctures mostly similar to pronotum, posteroventrally with fine sparser punctures; metapleuron smooth, sparsely punctate, punctures smaller than other parts of mesosoma; propodeum dorsally with large and deep flat-bottomed punctures, interspaces carinate and reticulate, the boundary between dorsal and posterior surfaces not obvious, punctures on lateral surface dense, interspaces carinate and reticulate, shallower than other parts of mesosoma except metapleuron, posterior surfaces obviously depressed, margin with dense and shallow punctures, and medially smooth and without punctures, the median carina with short oblique striae on both sides, median carina about 0.6 times of the length of the whole propodeum.

Metasoma. Leathery, punctures smaller than head and mesosoma; T1 about 1.5 times as wide as long, narrower than T2, punctures on anterior inclined surface sparse, punctures on dorsal surface dense, without punctures at the end, slightly concave near the end; T2 about 1.1 times as wide as long, with sparse punctures at base and then punctures gradually denser and larger near the apical margin, with thin apical lamella; S2 with sparse punctures in the middle, denser and larger laterally and apically than those at the base of T2, with thin apical lamella; T3–T5 with dense punctures; metasomal segment 6 almost without punctures.

Male (Fig. 12). Body length 6.0 mm, forewing length 5.5 mm. Sculpture, punctuation, setae, and coloration as in female except as follows: clypeus (Fig. 14) antenna ventrally, and mandible mostly yellow; clypeus about 1.2 times as wide as long, apical margin medially shallowly emarginated, transparent, laterally forming a short tooth, clypeal width about 3.5 times as wide as that of emargination; emargination about 4.8 times as wide as long; distance between inner eye margins at vertex about 1.6 times of the distance between inner eye margins at clypeus; A13 about 2.0 times as long as ba-

sal width, long, flat, curved, narrowing at the apex, backward reaching middle of A10 (Fig. 17); T2 about 1.2 times as wide as long, metasomal segment 6 with fine sparse punctures, metasomal segment 7 leathery and with especially fine sparse punctures.

Distribution. China (Yunnan).

Remarks. This species is easily distinguished from all other species of *Paraleptomenes* by the following character combination: anterior face of pronotum with a transverse fovea in the middle (Fig. 16), mesopleuron posterodorsally with obviously raised blunt teeth, and male A13 long, curved, and narrowed at the apex (Figs. 17).

Etymology. The specific name *transfoveolus* is derived from two Latin words: *trans-* (= across) and *foveola* (= hole), referring to the transverse fovea of pronotum.

Paraleptomenes darugiriensis Kumar, Carpenter & Sharma, 2014, new record

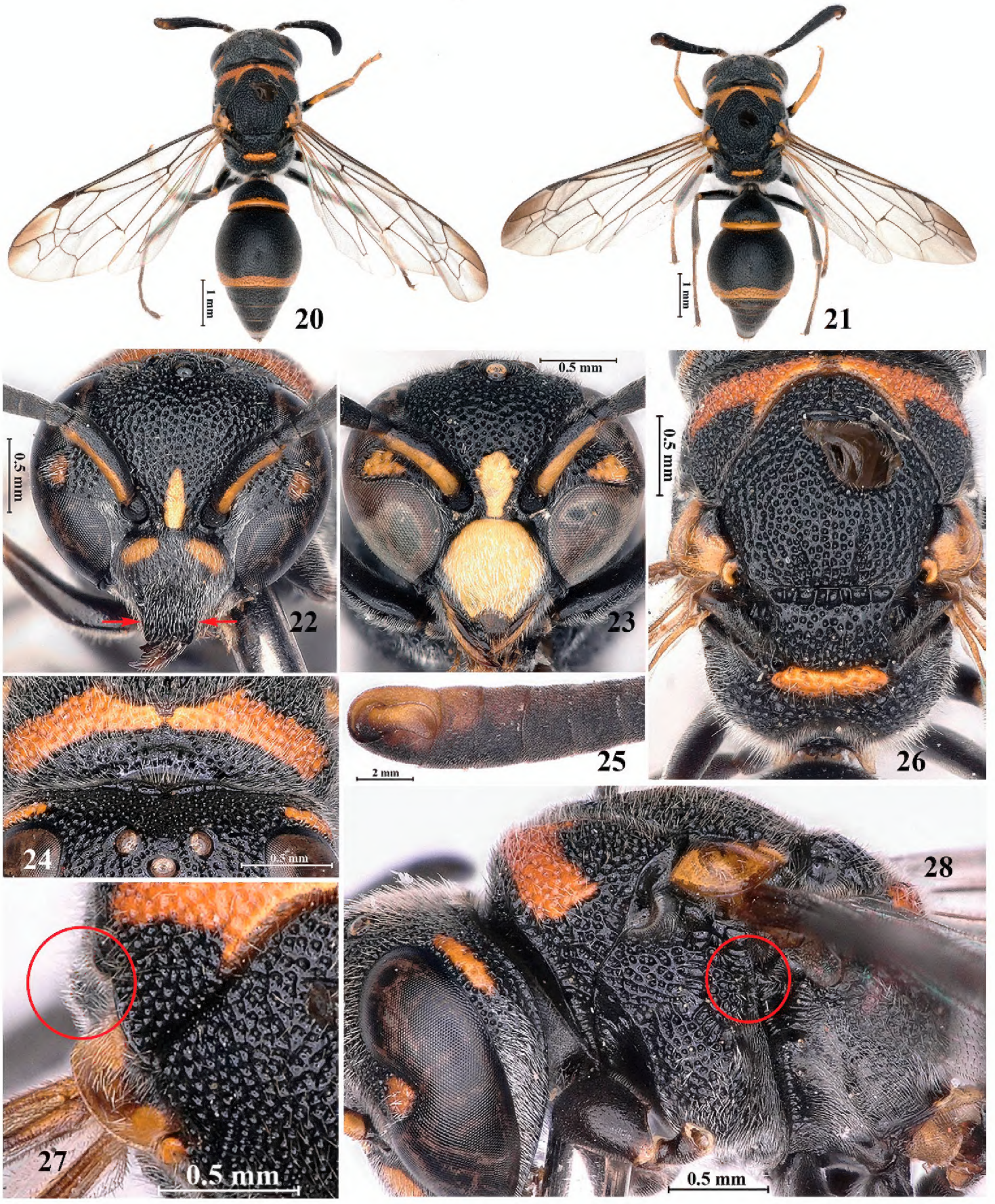
Figs 20–28

Paraleptomenes darugiriensis Kumar, Carpenter & Sharma, 2014: 132–135.

Material examined. 1♀, China, Guangxi Province, Chongzuo City, Fusui County, Changping Township, 22°38'29.45"N, 107°54'41.36"E, 2016.vi.5, Zhenxia Ma (CNU); 15♀13♂, China, Yunnan Province, Puer Town, Yuan County, Mengda Town, Longtang Village, 24°1'58.80"N, 100°51'21.60"E, 2017.vi.10, Yan Peng (CNU); 18♀15♂, China, Yunnan Province, Baoshan City, Tengchong City, Hehua Township, 24°58'34.83"N, 98°23'12.69"E, 1327m, 2015.vii.31, Long Li (CNU).

Diagnosis. Female (Fig. 20) body length 5.5–7.0 mm, forewing length 5.5–6.5 mm; male (Fig. 21) body length 5.5–5.7 mm, forewing length 4.7–5.5 mm; black, with the following parts orange or yellow: most of mandible, two small lateral spots at the base of clypeus, male clypeus yellow except outer margin, longitudinal interantennal spot, scape ventrally and flagella ventrally (or not), a small spot of ocular sinus, a line behind eyes at gena, an anterior band of pronotum, tegula (except brownish red middle), parategula, metanotum, apices of fore and mid femora dorsally, irregular spots of fore and mid tibiae, apical bands of T1–T2 and S2 (sometimes break); head and mesosoma with very coarse punctures, interspaces strongly reticulate; clypeus flat in the middle part, with lateral longitudinal raised carina at apex, and with fine sparse punctures, and punctures at apex larger and deeper, or even longitudinally striate, apical margin somewhat emarginated and almost truncated (Fig. 22); male clypeus with fine sparse punctures, apical margin moderately emarginated, transparent, laterally forming a short tooth (Fig. 23); male A13 about 2.7 times as long as basal width, flat, curved, and widen at the apex, backward reaching base of A11 (Fig. 25); occipital carina distinctly sinuate and almost incised in the middle (Fig. 24); anterior face of pronotum concave weakly, with two almost coalesced weak foveae (Fig. 24); scutellum convex in lateral view (Fig. 28); metanotum sloping down to apical margin; mesopleuron posterodorsally slightly raised (Fig. 27); T2 and S2 with thin apical lamellae.

Distribution. China (new record: Guangxi, Yunnan); India.

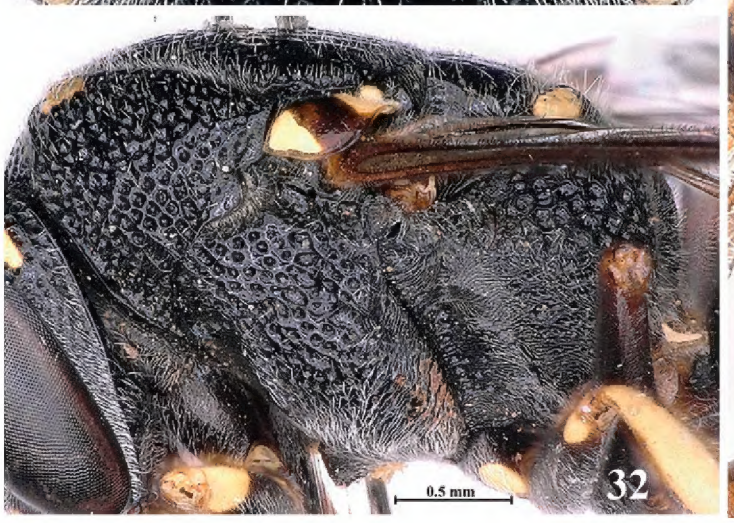


Figures 20–28. *Paraleptomenes darugiriensis* Kumar, Carpenter & Sharma, 2014. ♀ **20, 22, 24, 26, 27, 28** ♂ **21, 23, 25**. **20, 21** habitus (dorsal view) **22, 23** head (frontal view) **24** vertex and part of pronotum (dorsal view) **25** A7–A13 **26** mesosoma (dorsal view) **27** tegula (dorsal view) **28** mesosoma (lateral view).

Paraleptomenes nurseanus montanus Giordani Soika, 1994, new record

Figs 29–33

Paraleptomenes nurseanus montanus Giordani Soika, 1994: 123, 124, 125; Kumar, Carpenter and Sharma 2014: 132–133.



Figures 29–33. *Paraleptomenes nurseanus montanus* Giordani Soika, 1994. ♀**29–33 29** habitus (dorsal view) **30** head (frontal view) **31** vertex and part of pronotum (dorsal view) **32** mesosoma (lateral view) **33** mesosoma (dorsal view).

Material examined. 1♀, China, Yunnan Province, Xishuangbanna Dai Autonomous Prefecture, Jinghong City, Lancang River, 21°57'18.09"N, 100°51'36.65"E, 541m, 2008.vii.27, Miao Li (CNU).

Diagnosis. Female (Fig. 29). Body length 6.4 mm, forewing length 5.5 mm; black, with the following parts yellow: the base of mandible, lateral longitudinal band along clypeus, elliptic interantennal spot, scape ventrally, ocular sinus, a line behind eyes at gena, two anterior interrupted spots of pronotum dorsally, tegula (except brownish red

at middle), parategula, two anterior interrupted spots on metanotum, mid coxa ventrally, apices of fore and mid femora, fore and mid tibiae (slightly dark ventrally), hind tibia dorsally, tarsi, apical bands of T1–T2 and S2, and mandible mostly; fore wing with an apical dark spot. Clypeus flat in the middle part, without lateral longitudinal raised carina, with extremely fine sparse punctures, and smooth, apical margin a bit emarginated and almost truncated (Fig. 30); frons with sparse punctures in the middle part, interspaces with extremely fine punctures (Fig. 30); posterior area of hind ocelli with a row of slightly long longitudinal carina (longer than other species) along occipital carina in the middle area, occipital carina dorsally developed and complete, with thick hair (Fig. 31), not sinuate as in *P. darugiriensis* (Fig. 5); anterior face of pronotum with a large deep fovea in the middle (Fig. 31); mesoscutum with sparse punctures in the posterior half, interspaces with extremely fine punctures (Fig. 33); scutellum and metanotum with sparse punctures, interspaces with extremely fine punctures, scutellum nearly flat in lateral view, scutellum at the same level as the mesoscutum (Fig. 32); posterior surface of propodeum with irregular striae and few punctures; T1 elongated, almost hemispheric, T1 slightly concave near the end, both T2 and S2 with apical lamellae.

Male. Unknown.

Distribution. China (new record: Yunnan); India.

Paraleptomenes kosempoensis (Schulthess, 1934)

Figs 34–39

Odynerus kosempoensis von Schulthess, 1934: 102.

Paraleptomenes kosempoensis; Giordani Soika, 1986: 127; 1994: 123, 125; Li et al. 2019: 152–153.

Material examined. ***Syntype***, 1♀, Kankau (Koshun), Formosa, VI. 1912, H. Sauter (AMNH); 1♂, same data as the syntype (AMNH).

Notes. The female specimen deposited in AMNH was labelled as paratype, but the original description of Schulthess (1934) did not specify a holotype. The above female specimen is thus a syntype. And the male was unknown in the original description, so the male specimen with the same data is not as a syntype.

Diagnosis. Female (Fig. 34) body length 6.0 mm; male (Fig. 35) body length 5.0 mm. Black, with the following parts yellow: mandible basally, female clypeus except middle, whole male clypeus, longitudinal interantennal spot, scape ventrally, a small spot of ocular sinus, a line behind eyes at gena, an anterior complete band of pronotum, tegula, parategula, a round spot on mesopleuron dorsally, large lateral right triangle spots on scutellum, metanotum, mid and hind coxae ventrally, apices of fore and mid femora to tarsi, hind tibia ventrally and hind tarsus, apical bands of T1–T2 and S2, and apical band of male T3; with the following parts reddish brown to brown: mandible, antenna ventrally and legs except yellow spots; clypeus with sparse punctures and dense white setae; female clypeus raised basally and then flat in the middle,

Figures 34–39. *Paraleptomenes kosempoensis* (Schulthess, 1934). Syntype (♀) **34, 36, 39** ♂ **35, 37, 38**. **34, 35** habitus (dorsal view) **36** head (frontal view) **37** head (frontal view) **38** A3–A13 **39** part of mesosoma and metasoma (dorsal view).

with lateral longitudinal raised carina, apical margin shallowly emarginated medially (Fig. 36), apical margin of male clypeus deeply emarginated medially (Fig. 37); male A13 small, hook-like, backward reaching the middle of A11 (Fig. 38); punctures on mesosoma larger than that of head; anterior face of pronotum with two foveae in the middle; scutellum nearly flat in lateral view, and at the same level of the mesoscutum;

punctures on metasoma sparser and smaller than those on head and mesosoma; metasoma without apical lamella; T1 not concave posteriorly; T2 and S2 apically with a row of punctures forming a horizontal furrow near apical margin (Fig. 39); male T3 with apical lamella and with a row of punctures as that on T2.

Distribution. China (Taiwan, Hong Kong).

Key to species of genus *Paraleptomenes* (modified from the keys of both Giordani Soika, 1994 and Kumar et al., 2014)

1 Scutellum flat or nearly flat in lateral view; metanotum almost horizontal (Figs 32, 39) **2**

– Scutellum convex in lateral view; metanotum very oblique (Figs 10, 19, 28)..... **4**

2 Female frons with sparse punctures (Fig. 30); T1 elongated, almost hemispheric, about 1.5 times wider than long; punctuation of T2 almost uniform except apical margin with dense and coarse punctures ..... ***P. nurseanus*** **3**

– Female frons with dense punctures (Fig. 36); T1 very short, about 2 times as wide as long; T2 except base coarser and denser (Fig. 39)..... ..... ***P. kosempoensis*** **(Schulthess, 1934)**

3 Fundamental color of T1 red.... ***P. nurseanus nurseanus*** **Giordani Soika, 1970**

– Fundamental color of T1 black (Fig. 29)..... ..... ***P. nurseanus montanus*** **Giordani Soika, 1994**

4 Maximum width of T1 about equal to its median length (0.90–1.10 times) . .....***P. miniatus*** **5**

– Maximum width of T1 distinctly greater than its median length (1.25–1.90 times) 7

5 Fundamental color of T1 ferruginous .... ***P. miniatus miniatus*** **(de Saussure, 1855)**

– Fundamental color of T1 black..... **6**

6 Pronotum, scutellum, metanotum and mesepisternum with yellow spots; female clypeus partly yellow.....***P. miniatus mephitis*** **(Cameron, 1901)**

– Thorax black except two small yellow spots on metanotum; female clypeus entirely black ..... ***P. miniatus nigrithorax*** **Giordani Soika, 1994**

7 Mesopleuron dorsally with punctures, and ventrally smooth and shiny..... .....***P. guichardi*** **Giordani Soika, 1994**

– Mesopleuron wholly with punctures..... **8**

8 Punctation of T1–T2 obviously coarse..... **9**

– Punctation of T1–T2 not coarse as above (Figs 1–2, 11–12, 20–21, 29)... **10**

9 Punctation of T2 much larger than those of pronotum or mesoscutum; T2 with three broad humps, one in the middle and two lateral pre-apically (Fig. 11 in Kumar et al. 2014) .....***P. humbertianus*** **(de Saussure, 1867)**

– Punctation of T2 smaller than those of pronotum or mesoscutum; T2 without humps (Fig. 5 in Nguyen and Nguyen, 2020) .... ***P. incultus*** **Nguyen & Nguyen, 2020**

10 Transverse furrow on T1 pre-apically very broad and deep (Fig. 23 in Kumar et al. 2014); female clypeus with large punctures, somewhat elongated in the longitudinal direction ..... ***P. rufoniger* Giordani Soika, 1994**

– Transverse furrow on T1 pre-apically not very broad and deep as above; female clypeus without large punctures..... **11**

11 Female clypeal punctation coarser, interspaces between punctures basally with fine punctures (Figs 13, 22); male A13 long, about 2.0–2.7 times as long as basal width, curved and not straight (Figs 17, 25) **12**

– Female clypeal punctation not coarse as above, interspaces between punctures basally smooth and impunctate; male A13 short, obviously less than 2 times as long as basal width, and almost straight (Fig. 6)..... **13**

12 Male A13 widened at apex (Fig. 25); occipital carina dorsally distinctly sinuate in the middle, and almost notched (Fig. 24)..... ..... ***P. darugiriensis* Kumar, Carpenter & Sharma, 2014**

– Male A13 narrowed at apex (Fig. 17); occipital carina dorsally normal and complete in the middle (Fig. 16)..... .....***P. transfoveolus* Bai, Chen & Li, sp. nov.**

13 Female clypeus with lateral longitudinal raised carina; male clypeus about as long as wide; S7 basally without a row of thick brown setae..... .....***P. communis* Giordani Soika, 1994**

– Female clypeus with indistinct lateral longitudinal raised carina (Fig 3); male clypeus wider than long; S7 basally with a row of thick brown setae ....***P. setaceus* Bai, Chen & Li, sp. nov.**

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